# Corn Silage Quality: How is it Defined and Measured

## From a Nutritionist's Point of View

UCD Alfalfa Workgroup

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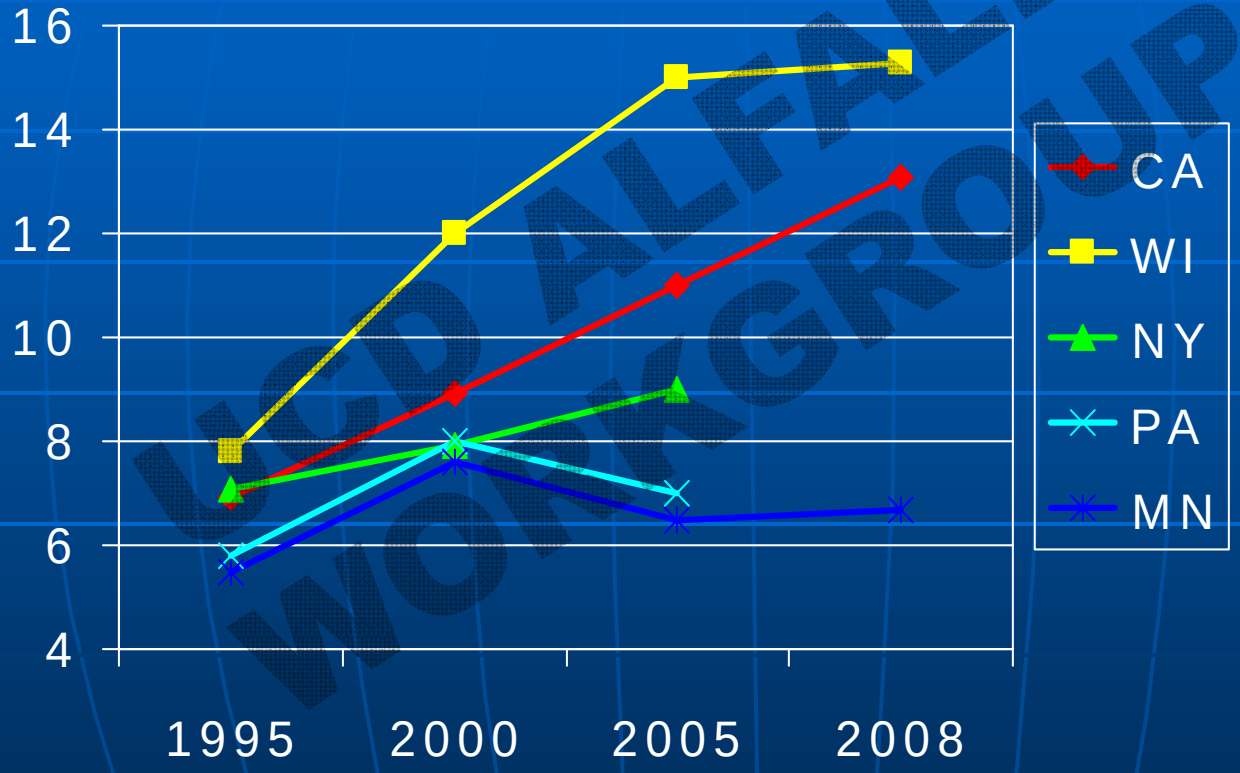
Mycogen Seeds

# Corn Silage Production in Top Dairy States (million tons)

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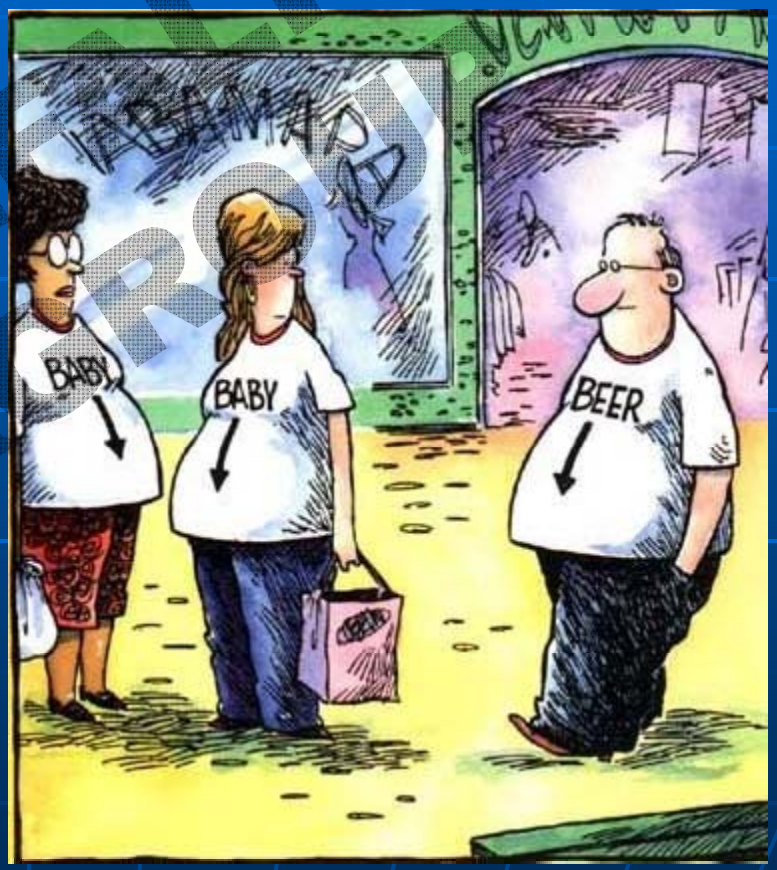
NASS

# Defining Corn Silage Quality:

- Yield
- Agronomics
- Traits
- Nutritional Parameters

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# Corn Plant

- Grain
  - 40-45% of plant DM
  - Starch
- Fodder
  - 55-60% of plant DM
    - Leaves = 15%
    - Stem = 20-25%
    - Cob, Shank, Husk = 20%
  - NDF

There is a wide variation in Corn Silage Hybrids

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# Take Home Point #1

- Don’t Judge Corn Silage Hybrids on Yield Alone
  - Consider Nutritional Factors

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# Nutritional Parameters:

- Starch
- Fiber Digestibility

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# Starch

- Starch is highly digestible
- Physical protection
- Usage is highly dependant on:
  - Kernel Maturity (Dry Matter)
  - Kernel Particle Size
  - Endosperm Type

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# Corn seed

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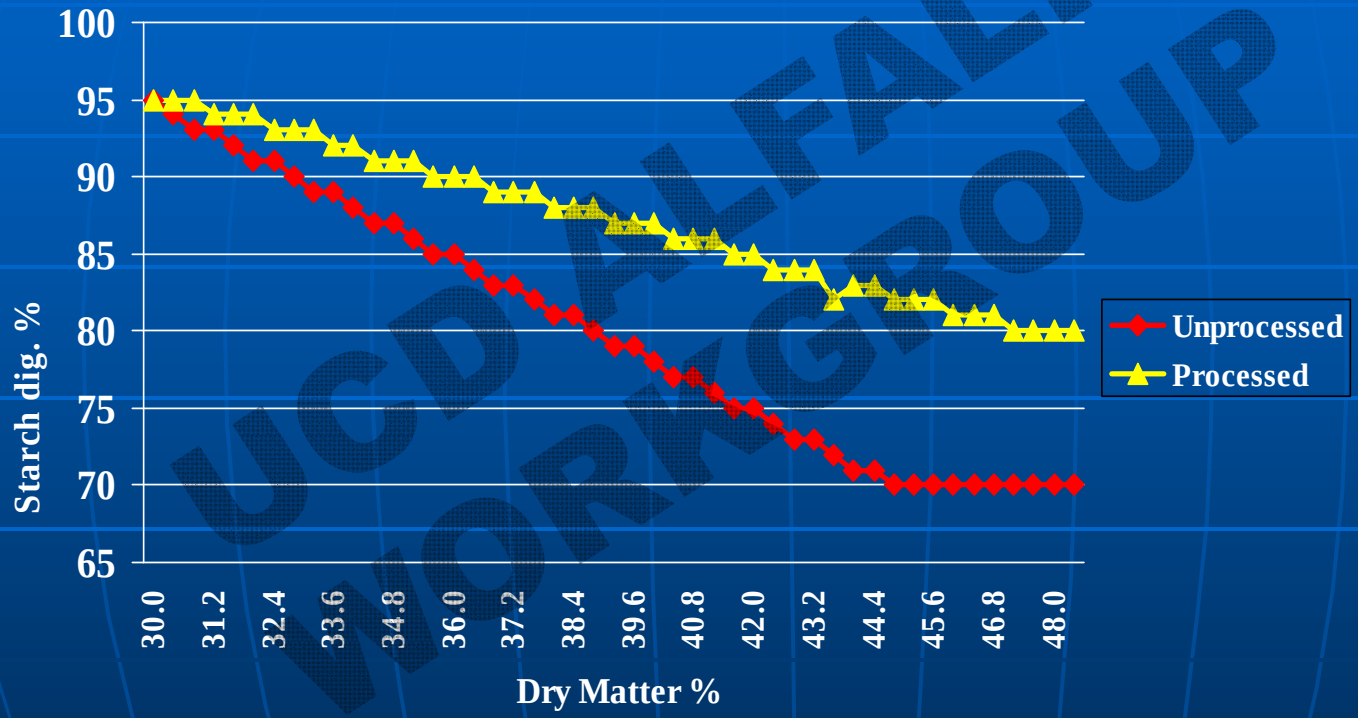
Nemose

# Predicted Total Tract Starch Digestibility
## Shaver, 2002

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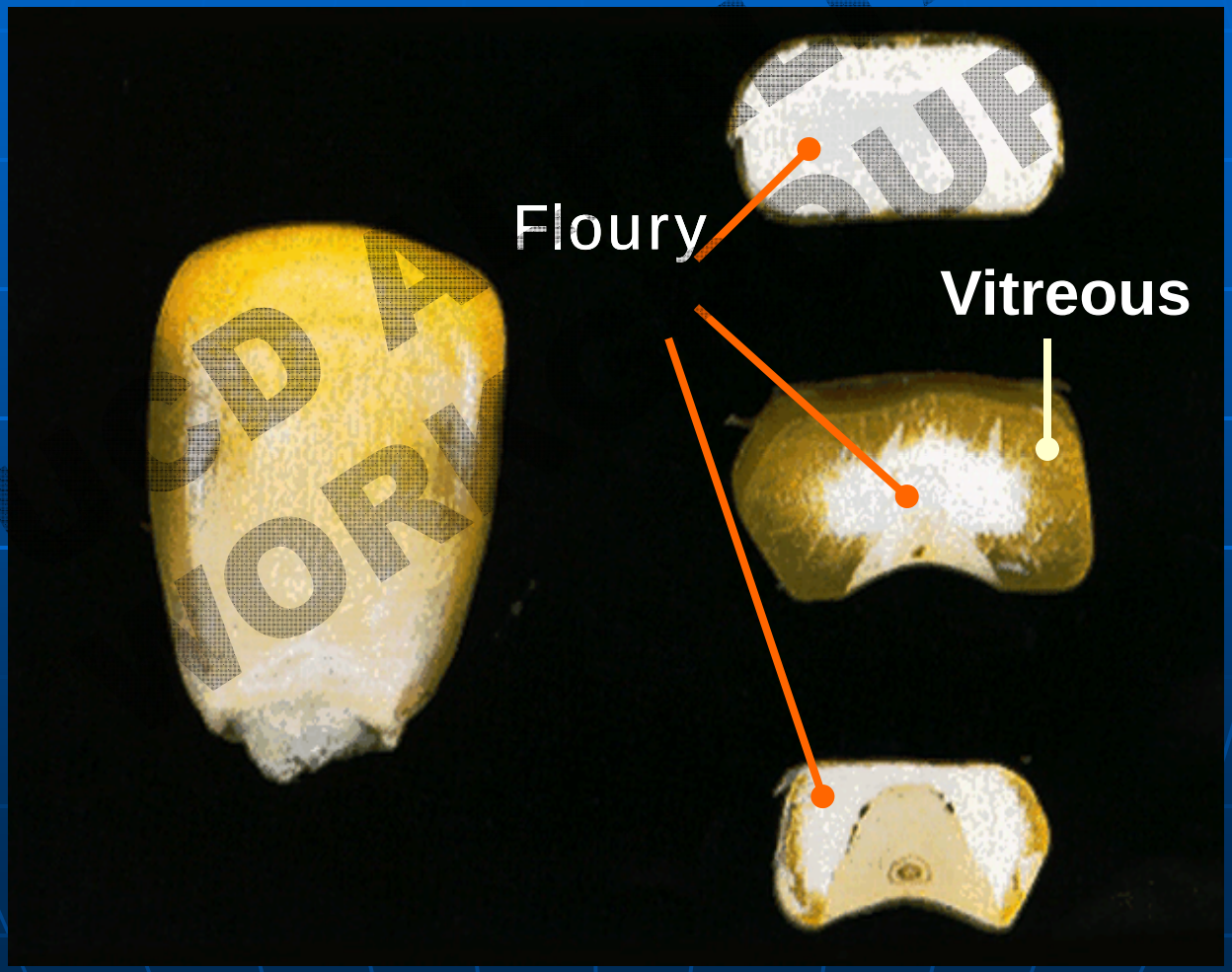
*Based on data of Bal et al., 2000; Dhiman et al., 2000; Rojas-Bourrillon et al.1987

# Endosperm Type



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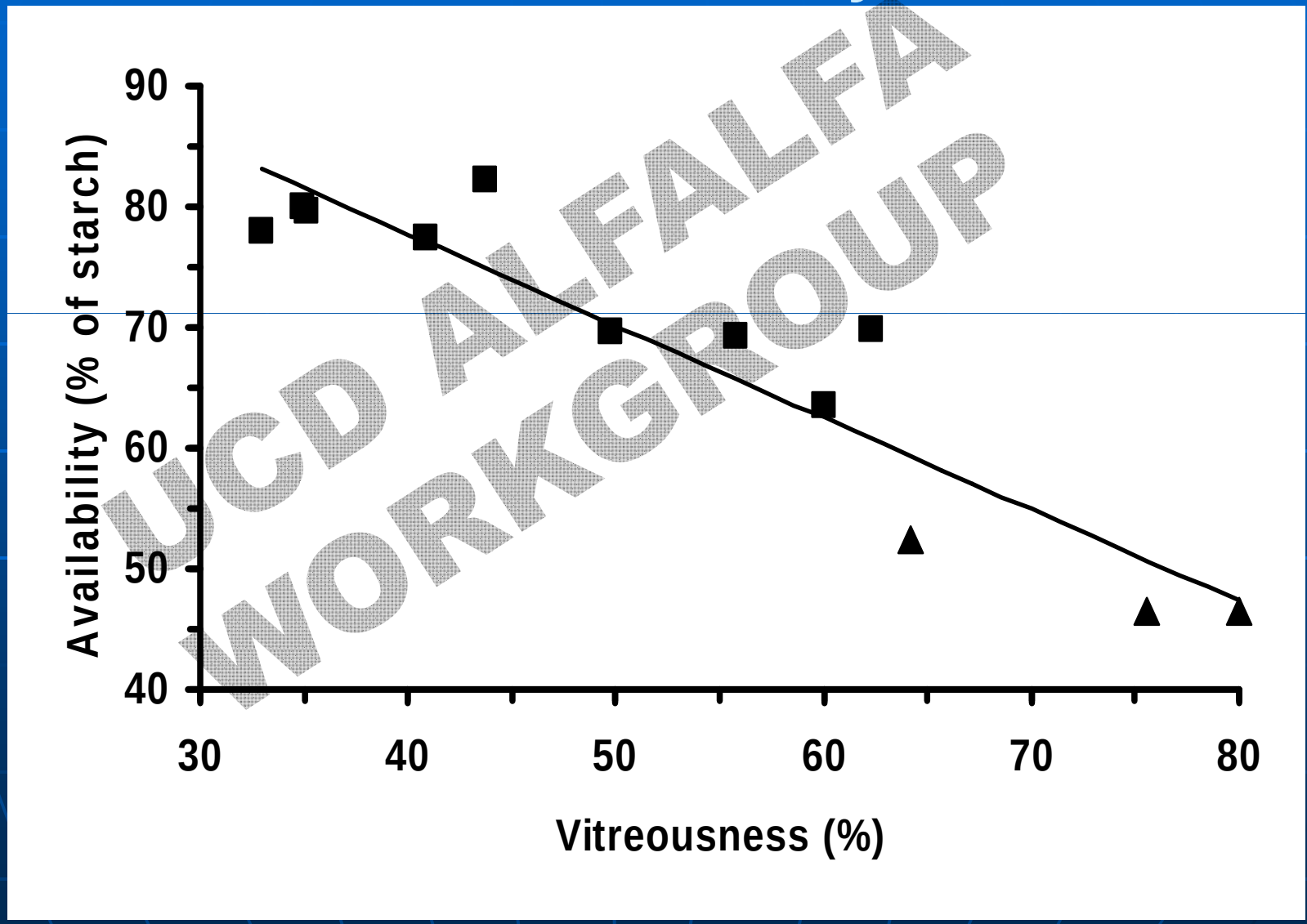
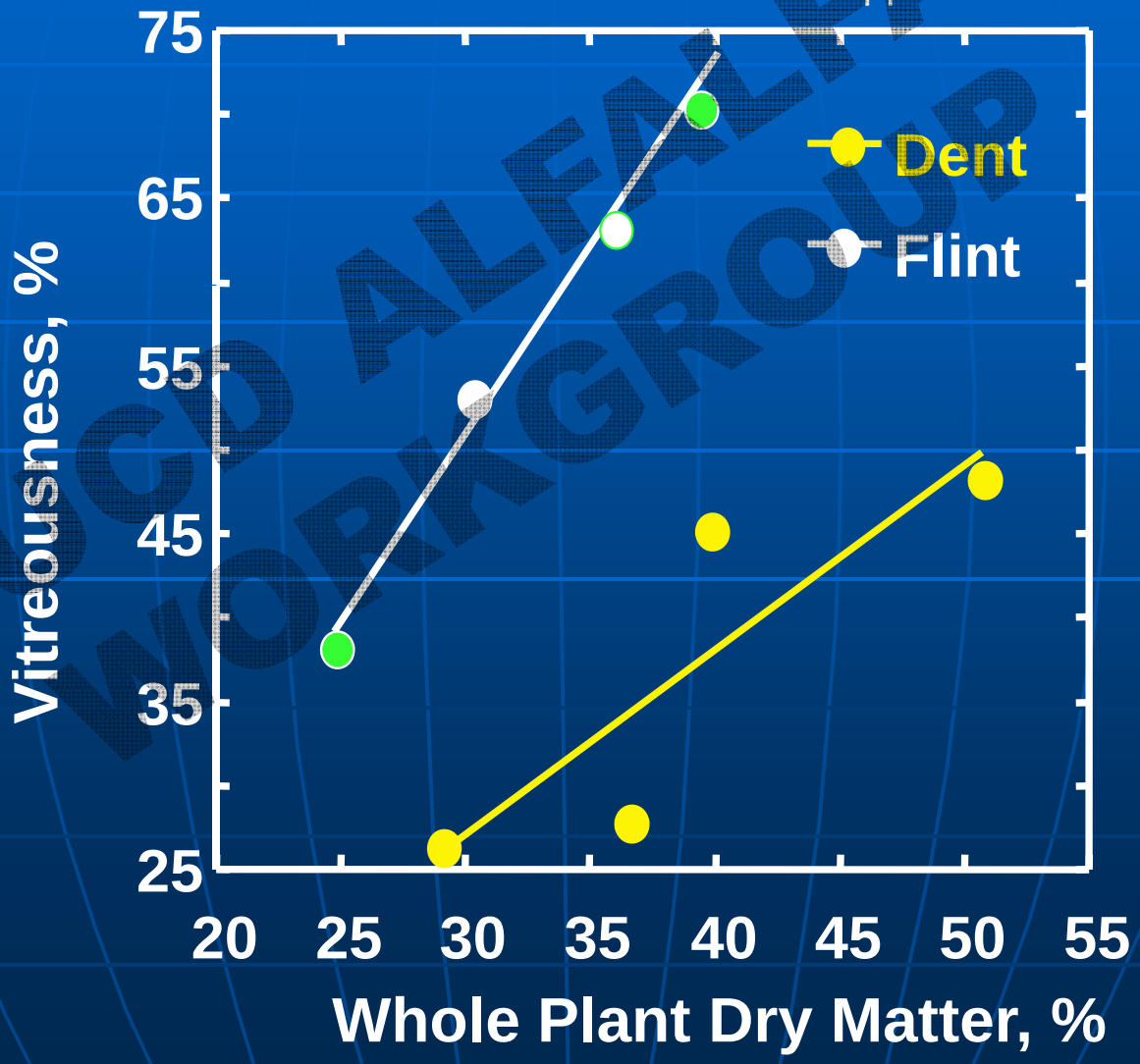
# Kernel Vitreousness & Ruminal *In Situ* Starch Availability




Correa et al., JDS, 2002

# Vitreousness increases with increasing DM

Philippeau and Michalet-Doreau, 1997

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# Fiber Digestibility

- Measured as NDF Digestibility
  - Highly variable
  - Range of Values

30% ⟷ 75%

Marshfield Lab data, 2004

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# Why Fiber Digestibility?

- Michigan State Research
  - 1 unit increase in NDF digestibility:
    - Increase in DMI
    - Increase milk production 0.55 lb.

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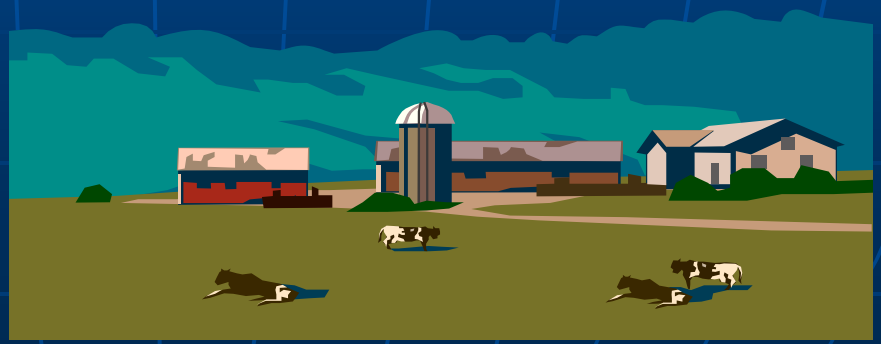

# Modern BMR Milk Production Research

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University

# Samples Analyzed for DNDF

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Ward, 2009 ADSA

# Take Home Point #2

- Look Closely at NDF Digestibility When Judging Corn Silage on Nutritional Value

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# Key Points about NDF Digestibility

- Hybrids should differ by 4 to 5 points before you will notice a milk production response

- When analyzing, use consistency
  - Similar RM's
  - Many different labs and methodologies
  - Consistent time points

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# Silage Evaluation Methods

- Milk per Ton
- Milk per Acre

- MILK95, MILK2000, MILK2006

  http://www.foragelab.com/resources/feedReports.cfm

- Corn Picker

  www.msu.edu/~mdr/cornpicker.html

  http://www.das.psu.edu/pdf/allenrankcornsilagehybrids.pdf

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# Your Ultimate Quality Evaluator

# Thank you for your attention